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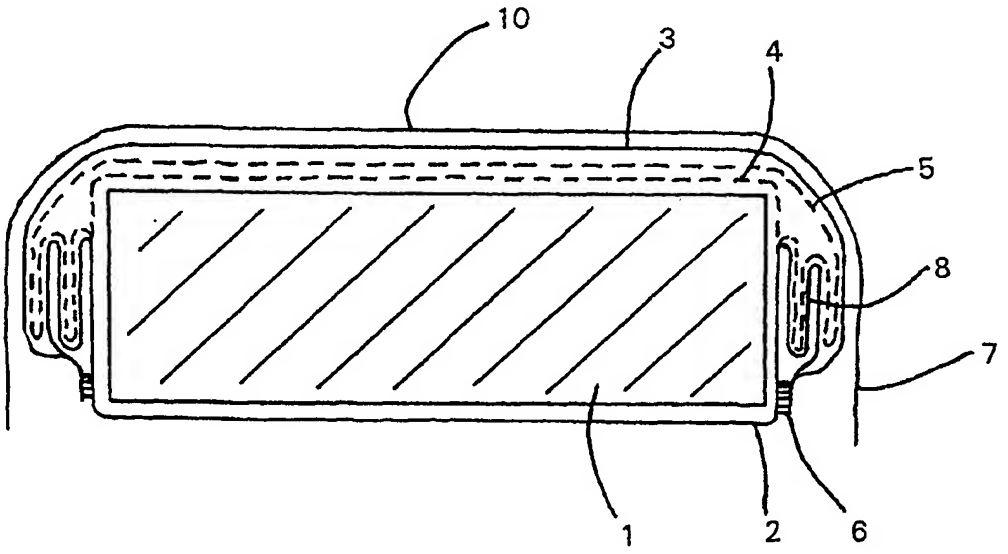
(54) Title: MATTRESS COVER



(57) Abstract: A matters cover is disclosed which comprises at least two longitudinally extending gussets (8), laterally positioned such that, in use, a gusset is positioned either side of an area for receiving a subject (10) lying longitudinally on the mattress; a low friction surface (4, 5) on the underside of the mattress cover such that the area for receiving a subject is laterally movable by an amount determined by the extent of the gussets; and securing means (6) for securing the area for receiving a subject such that lateral movement is restricted. In preferred embodiments the low friction surface is provided by slip sheets and the securing means is of hook and loop form.

WO 02/065877 A1

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MATTRESS COVER

The present invention relates to a mattress cover, in particular a mattress cover for use in turning a patient in bed.

It is important for the position of a patient to be altered during prolonged periods in bed in order to prevent further complications, such as pressure sores. Tissue damage can develop within a few hours if the patient does not change position regularly. The development of pressure sores is not only painful for the patient, but may prolong their treatment.

A patient may require the assistance of, for example, a nurse to move position in bed. Nurses may therefore required to lift and move patients on a regular basis, which can result in back problems. The incidence of back problems sustained by nurses after lifting patients is a growing problem, with some nurses leaving the profession through disability.

When a patient is rolled onto their side in a conventional manner, they may roll to a position near the edge of the bed. This lateral movement can be avoided if the nurse simultaneously lifts the patient's hips so that their main weight is lying along the central lateral line of the bed. Such lifting is strenuous, especially with obese patients.

Additional problems occur when helping a patient out of bed. For example, it is especially burdensome to transfer the hip area of a patient from the central lateral line of the bed toward the edge of the bed. Once at the edge, the patient's legs can be swung from the bed and the patient's shoulders can be lifted, to place the patient in a sitting position.

There have been many attempts to alleviate such problems. The introduction of tubular slip sheets has aided patient turning and movement in and from bed. Slip sheets are conventionally placed under the patient, to allow the patient to be turned or moved as the sheets slide past one another with greatly reduced effort. Thus, some of the risks faced by carers and nurses with regard to back injuries and the like have been alleviated.

Other measures used in an attempt to overcome the aforementioned problems with patient turning and movement include the use of hoists and slings, but these are often cumbersome and often not readily available.

Although the use of slip sheets has aided turning and movement of patients whilst in bed, they are not without problems.

Firstly, the slip sheets must be inserted under the patient, which may pose difficulties, especially if the patient is in pain. Also, once in place, slip sheets can often cause an unwanted movement of the patient across or down the bed. Although slip sheets are often provided in a tubular form in an attempt to restrict movement to only one direction, for example laterally, they still allow a significant degree of movement in all directions, especially if the patient is propped up in a seating position when they will tend to slide down the bed. Slip sheets should be made from a low friction material such as nylon so that they slide past each other with ease. The slip sheets should not be left in place since the nylon is uncomfortable, unhygienic and the patient is likely to slide in undesired ways, and hence require regular changing.

Another major consideration in hospitals is transfer of infection, and slip sheets must be washed after use. Many slip sheets are coated with silicone as a low friction material. However, the washing process can remove silicone and thus reduce the effectiveness of slip sheets when reused.

It is an object of the present invention to seek to overcome such problems.

According to the present invention there is provided a mattress cover which comprises:-

at least two longitudinally extending gussets, laterally positioned such that, in use, a gusset is positioned either side of an area for receiving a subject lying longitudinally on the mattress;

a low friction surface on the underside of the mattress cover such that the area for receiving a subject is laterally movable by an amount determined by the extent of the gussets; and

securing means for securing the area for receiving a subject such that lateral movement is restricted.

The mattress cover of the present invention thus comprises integral means for turning a subject, i.e. the present invention obviates the insertion and removal of slip sheets each time a subject needs to be turned. In addition, because the low friction surface does not come into direct contact with the subject, it does not require cleaning after each use. Lateral movement of the mattress cover allows a subject to be transferred to the edge of the bed, and also, because the lateral movement of the mattress cover can be restricted, undesired movement of the subject can be restricted.

Preferably, the gussets are provided along substantially the middle two thirds of the length of the mattress cover. In such an arrangement, lateral movement is permitted in the hip and shoulder region of a subject. Lateral movement in these areas allows the subject to be turned onto their side whilst remaining in the centre of the bed, due to the lack of movement at the head and foot of the bed.

The low friction surface is preferably provided by slip sheets positioned on the underside of the mattress cover. Slip sheets provide an effective low friction surface by which the subject can be turned on to their side or moved to the edge of the bed with ease. A wider top slip sheet may be provided over a narrower bottom slip sheet, which may be fixed in position relative to the mattress cover. The extra width of the top slip sheet can allow it to be moved with the gusset of the mattress cover over the fixed bottom slip sheet to the full extent of the gusset. With the bottom slip sheet fixed in position, the low friction surface is maintained across the width of the mattress. The slip sheets may be made of a material such as 2-4 oz nylon coated with a silicone. Alternatively, the low friction surface may be provided by a coating of a low friction material on the underside of the mattress cover, for example a coating of a silicone.

The means for securing the area for receiving a subject may conveniently comprise a hook and loop fastener. In this way, a subject can be easily moved by unfastening the hook and loop fastener, laterally moving the mattress cover by an amount determined by the extent of the gusset, and refastening the hook and loop fastener to thereby restrict movement of the subject.

If it is desirable to maintain lateral movement of the area for receiving a subject, then the gusset or a cotton over sheet may be used to blank the securing means and prevent the area for receiving a subject from being secured. By maintaining such lateral movement, the subject is able to move from side to side in a 'wagging tail' motion.

In use, an over sheet may be provided on a bed over the mattress cover of the present invention, whereby turning of a subject may be achieved by pulling the over sheet. A subject lying on the over sheet is not in direct contact with the mattress cover and thus the likelihood of contamination of the mattress cover is reduced. By lying on an over sheet the comfort of the subject can also be increased.

The mattress cover of the present invention may further comprise a lower section for attaching the mattress cover to a mattress. The lower section may for example be attachable to a mattress in the same way as a fitted sheet, for example having anchoring box corners, either above or under the mattress. In this way, movement of the mattress cover relative to the mattress can be restricted. In addition, the lower section may be releasably attachable to the mattress cover so as to form an envelope, for example by way of a zip fastening, having the low friction surface, for example slip sheets, contained within the envelope per the embodiment described above. In such an arrangement, the top slip sheet can be attached to either the bottom slip sheet and/or the lower or upper sections of the mattress cover at its lateral edges and so can move laterally due to its increased width when compared with the bottom slip sheet. The securing means for securing the area for receiving a subject may secure a gusset to the lower section to thereby restrict lateral movement.

The presence of a zip in the lower section of the mattress cover can allow the mattress cover to be removed from the mattress and either washed or placed onto an alternative mattress. Alternatively a zip can be provided on the underside of the mattress extending around the periphery of the lower section of the mattress cover, to reduce the possibility of the slip sheets becoming contaminated.

The mattress cover of the present invention is preferably waterproofed. In those embodiments having a lower section, a zip may be provided to releasably attach the lower section to the mattress cover. In such embodiments, the zip is protected against ingress of fluids, for example by being positioned so as to be inward from the edge of the mattress cover in use, or by means of a flap covering the zip.

If the mattress cover does become contaminated, it can be easily removed and washed. For example, for those embodiments employing slip sheets, if only the outer mattress cover is contaminated then the slip sheets may be removed before washing. Alternatively, if the slip sheets become contaminated, they can be removed and washed, or replaced by new slip sheets.

The present invention will now be described in detail with reference to the drawings in which;

Figure 1 shows a cross sectional view of an embodiment of the present invention on a mattress.

Figures 2a to 2c show the configuration of the mattress cover of Figure 1 before and after a subject is turned.

Figure 3 shows the mattress cover of Figure 1 illustrating the lateral gussets and securing means.

Referring to Figure 1, an embodiment of the mattress cover of the present invention comprises a lower section 2 and upper section 3 joined along their periphery. A longitudinal extending gusset 8 is provided between the upper section 3 and the lower section 2 on either side of an area for receiving a subject 10. A narrower bottom slip sheet 4 and wider top slip sheet 5 are contained within the mattress cover. The bottom slip sheet 4 is fixed at its lateral edges to the lower section 2 of the mattress cover and is therefore fixed in position relative to the mattress cover. The top slip sheet 5 is also attached to the lower section 2 of the mattress cover at its lateral edges, but is able to slide over the bottom slip sheet 4 by virtue of its increased width. A cotton sheet 7 is placed over the mattress cover. The upper section 3 is releasably secured to the lower section 2 by means of hook and loop fastener 6.

The slip sheets 4, 5 can be provided over substantially the middle two thirds of the mattress. In this way they allow lateral movement of the patient's body between the hips and shoulders. The lack of movement at the head and foot of the mattress is important to maintain the patients position. Longitudinal movement of the slip sheets is substantially prevented since the upper 3 and lower 2 sections of the mattress cover fit over the ends of the mattress securing the mattress cover in place.

Figures 2a to 2c show the configuration of the mattress cover before and after turning a subject 9. A subject 9 is turned by releasing the securing means 6, and laterally pulling on

the overlying cotton sheet 7 placed over the mattress cover (indicated in Figure 2a by an arrow). The lateral movement of the cotton sheet 7 causes the upper section 3 of the mattress cover to move correspondingly laterally by virtue of the friction between the upper section 3 and cotton sheet 7. Lateral movement of the upper section 3 is permitted by the low friction surface on the underside of the mattress cover, i.e. in this embodiment the slip sheets 4, 5. Were the slip sheets 4, 5 not present, the upper section 3 would not move freely with the cotton sheet 7. The extent of movement of the upper section 3 is determined by the extent of the gusset 8. Lateral movement of the cotton sheet 7 and upper section 3 of the mattress cover thus causes the subject 9 to turn, as indicated in Figure 2b.

Once the subject 9 has been turned, further lateral movement of the upper section 3 of the mattress cover can be restricted by refastening the fastener 6 to the lower section 2, as shown in Figure 2c.

Figure 3 shows a gusset 8 in more detail. In this embodiment, the gusset 8 is between the upper section 3 and lower section 2 of the mattress cover. The extent of the gusset 8, which determines the amount of lateral movement of the area for receiving a subject, is shown by arrow A. The gusset 8 is tapered such that at the meeting point between the upper section 3 and lower section 2 there is formed a stress point. The angle θ at which the upper section and lower section meet at this point is kept to a minimum so that the stresses at this point are minimised. Hence, the shape of the gusset 8 comprises a sharp taper at each end. As shown, the top slip sheet 5 may extend only along a part of the longitudinal extent of the cover, preferably to correspond with contact

points of a patient's shoulders and hips. In any event, the slip sheets 4, 5 are unlikely to extend beyond knee and shoulder contact points. In addition, the upper sheet 3 may be made of a material having a little elasticity which aids in dispersal of any stress forces at this point.

In the embodiment shown in the Figures, the lower section 2 of the cover may be made from waterproof non-elastic material and the upper section from waterproof vapour permeable material with some elasticity, primarily in the lateral direction.

The present invention can thus provide a mattress cover which comprises integral means for turning a subject, i.e. the present invention obviates the insertion and removal of slip sheets each time a subject needs to be turned. In addition, because the low friction surface does not come into direct contact with the subject, it does not require cleaning after each use. Lateral movement of the mattress cover allows a subject to be transferred to the edge of the bed, and also, because the lateral movement of the mattress cover can be restricted, undesired movement of the subject can be restricted.

The present invention can be used on a variety of mattresses such as those made from foam, springs, or fluids such as alternating air mattresses.

The present invention can be used with a mattress as described in UK 9905507.1, such that when the side humps are rolled up level with the buttocks of a subject and a pillow is placed under the mattress level with the shoulders, then the cotton bed sheet can be pulled to roll and hold the patient either

fully or partially on their side. This feature is particularly helpful when treating patients with serious pressure sores on their sacrum, to prevent them relapsing onto the flat of their back. It can also be useful when giving the patient a partial turn to the '30 degree tilt'. Often such a change of position can be achieved without disturbing the patients sleep or causing them excessive pain.

Another advantage of the present invention arises when returning a subject to bed. The securing means can be released, allowing the part of the mattress cover that would normally be under the subject's hips to be pulled so that it is now close to the edge of the mattress, after which the securing means can be refastened. The subject can be sat down on the mattress, their legs raised and swung onto the bed and their upper body lowered. Next the securing can be re-released and the patient pushed and slid into the centre of the bed. Finally the securing means can be refastened in a normal position. This reduces the lifting required by the nurse.

CLAIMS

1. A mattress cover which comprises:-

at least two longitudinally extending gussets, laterally positioned such that, in use, a gusset is positioned either side of an area for receiving a subject lying longitudinally on the mattress;

a low friction surface on the underside of the mattress cover such that the area for receiving a subject is laterally movable by an amount determined by the extent of the gussets; and

securing means for securing the area for receiving a subject such that lateral movement is restricted.

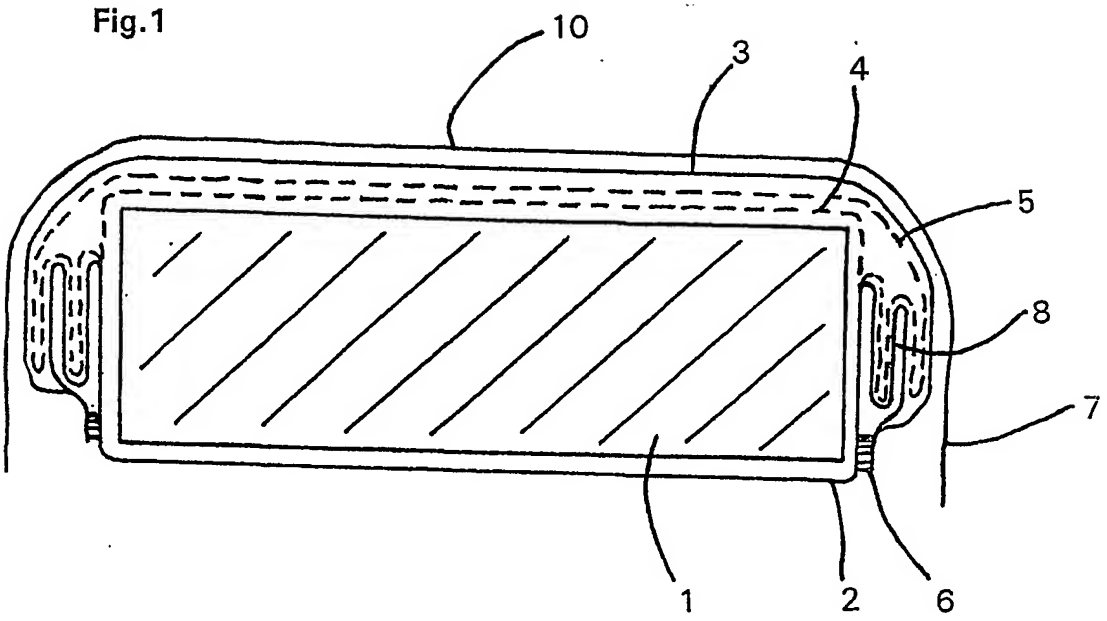
2. A mattress cover according to claim 1 wherein lateral gussets are provided along substantially the middle two thirds of its length.

3. A mattress cover according to claim 1 or 2 wherein the low friction surface is provided by slip sheets.

4. A mattress cover according to claim 3 wherein a wider top slip sheet is permitted to slide over a fixed narrower bottom slip sheet.

5. A mattress cover according to any preceding claim wherein the securing means is of the hook and loop form.

Fig.1



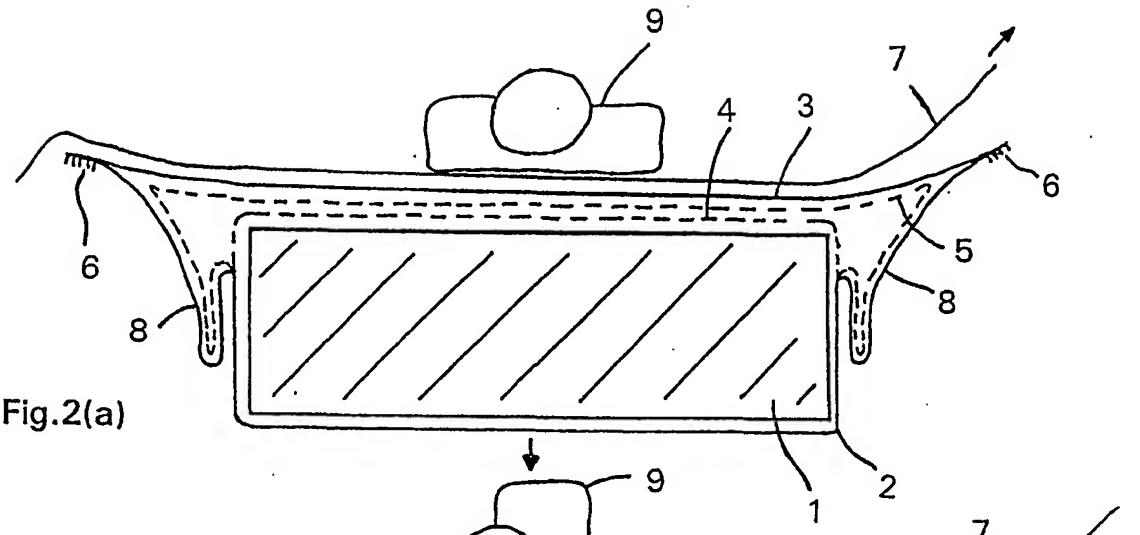


Fig.2(a)

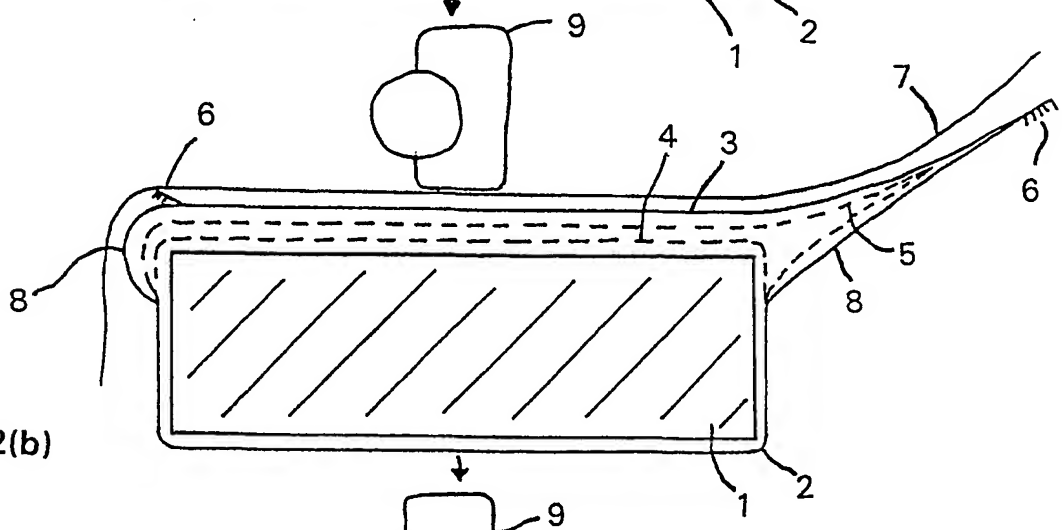


Fig.2(b)

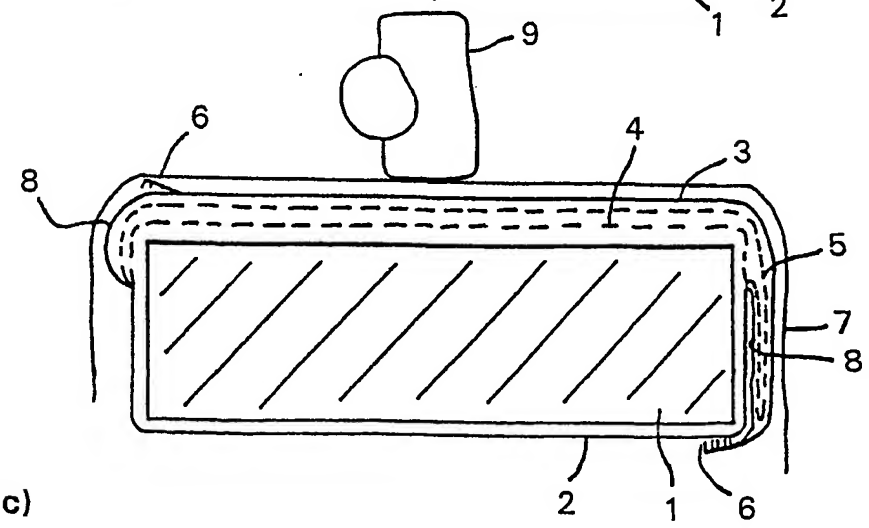
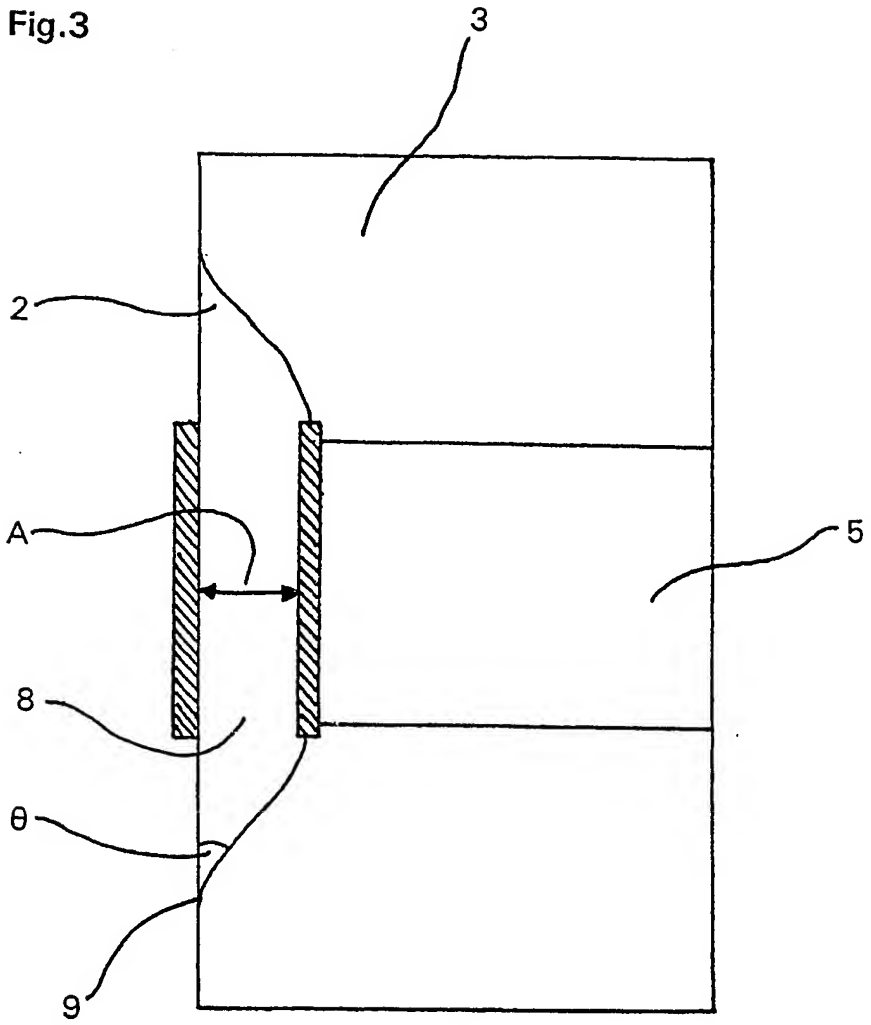


Fig.2(c)

Fig.3



INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A47C21/06 A61G7/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A61G A47C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 297 11 835 U (MEDICAL INTELLIGENCE MEDIZINTE) 6 August 1998 (1998-08-06) page 3, line 1 -page 4, line 23; figures	1
A	US 4 051 565 A (BERGE TRYGVE) 4 October 1977 (1977-10-04) column 4, line 18 - line 37; figures	1
A	US 5 329 655 A (GARNER DEAN) 19 July 1994 (1994-07-19) column 3, line 40 -column 4, line 42; figures	1
A	WO 88 01158 A (BUTCHER IAN DONALD ;KANZLER GRAHAM LESLIE BERNHARD (AU)) 25 February 1988 (1988-02-25) page 9, line 11 - line 19; figures 5-7	1

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
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